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SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING JUNE, 1926

By HERBERT H. KIMBALL, Solar Radiation Investigations

For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements, the reader is referred to the REVIEW for January, 1924, 52: 42, January, 1925, 53: 29, and July, 1925, 53: 318.

From Table 1, it is seen that solar radiation intensities averaged above the normal for June at all three stations.

Table 2 shows a decided excess in the amount of radiation received on a horizontal surface from the sun and sky at Madison, a slight excess at Lincoln, and a pronounced deficiency at Washington.

Skylight polarization measurements made on four days at Washington give a mean of 54 per cent, with a maximum of 56 per cent on the 28th. Measurements made on six days at Madison give a mean of 60 per cent, with a maximum of 64 per cent on the 8th. These are close to the corresponding averages for June for the respective stations.

TABLE 1.—Solar radiation intensities during June, 1926—Contd.

		Sun's zenith distance										
		8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
Date	75th mer. time	Air mass										solar time
		A. M.					P. M.					
		e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	
June 1	7.57	cal.	cal.	cal.	cal.	cal.	1.33	cal.	cal.	cal.	cal.	mm.
3	6.76					1.09	1.38					8.81
4	6.76						1.35					8.18
5	7.04			0.88	1.00							6.50
8	8.18			0.93	1.05	1.19						6.76
9	8.18					1.21	1.37					8.18
15	9.47					1.37	1.37					8.18
19	7.29					1.37	1.37					7.29
23	6.27					1.37	1.37					9.14
26	9.14			0.80	0.97	1.15	1.44					9.14
30	7.57					1.39						9.47
	9.14											7.29
Means			0.89	1.01	1.16	1.38						
Departures			+0.01	+0.04	+0.06	+0.06						

LINCOLN, NEB.

June 1	6.27		0.71	0.98	1.23	1.43						4.95
2	7.29		0.80	0.95	1.12	1.37						7.29
4	9.83					1.43	1.18	1.00	0.80			8.81
6	8.48						1.08	0.81				5.56
7	8.18						1.11	0.93	0.79			6.02
16	14.10						1.13					16.79
17	9.14				1.07	1.26	1.48	1.13	0.97			7.87
23	9.14		0.78	0.94	1.19	1.36						7.57
26	7.04				0.93	1.19	1.28	1.10	0.92			6.50
27	8.48				0.95	1.02	1.27					8.48
Means			0.81	0.98	1.21	1.39	1.12	0.93	0.84			
Departures			+0.04	+0.05	+0.11	+0.04	+0.03	+0.03	+0.07			

TABLE 1.—Solar radiation intensities during June, 1926

[Gram-calories per minute per square centimeter of normal surface]

WASHINGTON, D. C.

		Sun's zenith distance										
		8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
Date	75th mer. time	Air mass										Local mean solar time
		A. M.					P. M.					
		e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	
June 2	10.97	mm.	cal.	mm.								
8	10.59				0.41	0.71	1.14					7.87
9	8.81			0.59	0.81	1.03	1.32					8.18
10	9.83						1.24					8.48
11	7.29					1.16						8.48
17	8.48				0.92	1.16						8.18
21	9.14			0.77	0.90	1.06	1.20					9.47
25	11.81				0.72	0.90	1.17					7.04
28	9.14			0.80	0.96	1.16	1.45	1.01				12.24
29	12.24						1.22					11.38
30	13.61				0.84	0.94	1.05					12.68
Means			0.72	0.79	0.99	1.22	1.01					
Departures			+0.10	+0.07	+0.10	+0.01	+0.09					

* Extrapolated.

TABLE 2.—Solar and sky radiation received on a horizontal surface [Gram-calories per square centimeter of horizontal surface]

Week beginning—	Average daily radiation					Average daily departure from normal		
	Washington	Madison	Lincoln	Chicago	New York	Washington	Madison	Lincoln
June 4 1926	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
11	393	638	630	463	358	-101	+141	+90
18	427	412	460	314	369	-67	-68	-73
25	425	585	530	508	377	-69	+62	-43
Mean	575	538	639	468	400	+84	+4	+32
Excess since first of year on July 1						+1,694	+3,521	+756